

by HENRY POPKIN

Ramsay William Hunter

Colnaghi's

Treasures from the Hunterian

by DENYS SUTTON. Editor of Apollo

DFT

camp Hells Angel act. Family were out to entertain rather than to shock and for the first time the quality of their music came across to me.

Perhaps if they had shaken off some of their destructive tendencies and been slightly more melodic they might have had the international acclaim many predicted for them. But really it would not have suited Family. So it is home to Leicester for the final concert and then into solo careers and record production—an honorable retirement for ageing pop stars.

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NY THORNCRO

really hateful concerts. On Saturday he seemed much more mellow, letting the equipment off lightly and quite content to sing the highlights from the Family repertoire, ranging from their hit "The Weavers Answer to a Sweet Desire," a very good song from their last LP.

The music is not easy, full of discords and incoherent lyrics. But it has a constant energy which lifts it apart from that of any other group. And the level of musicianship is high. Guitarist Charlie Whitney and Jim Cresan are exciting, and the new recruit Tony Aston enjoys himself on the keyboards trying to up-stage Chapman with a

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Mr. Ives' Magic Punch and Judy Show

DEBORAH PICKERING

In 1903 the University of Glasgow conferred upon Whistler the honorary degree of Doctor of Laws, as it did on Rodin in 1906. It was a wise move for many years later his heirs-in-law, Miss Rosalind Birnie Philip, his sister-in-law, presented the university with what she felt were the best of his artworks which were in her possession. This gift was followed by a number of papers and a final bequest of what remained in her collection. This munificent act transformed the university into a centre of Whistler studies. Miss Philip was a strong-minded woman and years later when her husband tried to persuade her not to destroy the letters which Mallarmé wrote to her brother-in-law. Fortunately, she agreed not to destroy them and they have been published by Professor Barber.

This exhibition is well worth a visit just to see the Whistlers.

Radio 4 Autumn schedule

recent years and show that a University Museum can keep abreast of modern trends. The quality and interest of the works in the Hunterian Museum is not in dispute, and it is to be fervently hoped that the University succeeds in raising the sum, £200,000, required for the completion of the new building. If it does succeed in its aim, much will be owed to the enterprise of Andrew McLaren Young, who has fought long and hard for the future of the collection, of which he is Honorary Keeper.

able success.
Christopher
Hampton

Family by ANTO

...art schools, and has changed not
...ut all—which is probably why
...they are now packing it in.

The group is built around
Roger Chapman, a rough-looking
public bar room type, who sings
in a high reedy voice, destroys
amfibious, wipes himself
continually with a towel, throws
the microphone around the
stage, and acts generally like
an unrepentant yob, never
happier than when swapping
abuse with the front row.

Five years ago Chapman's
performance as a nasty in the
criticism of uncontrollably violent
emotion was an eye-opener. He
made sure you sat near an exit,
it led to some good and to some

Rainbow Theatre

Family by ANTO

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really hateful concerts. On Saturday he seemed much more mellow, letting the equipment off lightly and quite content to sing the highlights from the Family repertoire, ranging from their hit "The Weavers Answer" to "Sweet Desiree," a very good song from their last LP.

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The Doge's Palace, aptly described by James Morrice as "the most splendid assembly hall on earth," is ringed on Sunday by the long, grey outside-broadcast lorries of Radio Televisione Italiana. They crossed Venice's under-lagoon on Sunday by cable ferry, rolling off at St. Mark's Square during an absurdly mild winter storm, and were standing by to transmit over the European Broadcasting Union network last night's presentation of the 25th series of Prix Italia awards for radio and television programmes.

Italy has won 14 prizes during which 44 broadcasting organisations from some 30 countries have presented their best television and radio programmes to the juried delegates and the winners' congratulatory dinner at Palazzo La Scala emerged with two of the major awards—the BBC's *Making of a Naturalist* History Film won the Prix Italia for documentary television production and *James and the Giant Peach* the first prize. The *Pump* won the BBC another Prix Italia for radio drama.

The documentary prize added to the record of success—unparalleled in the history of the prizes, which are the most highly esteemed of all broadcasting awards. During the last 16 years Britain has won the television prize 10 times, the radio prize 11 and although as a country we have the benefit of being permitted two entries (one from ITV and one from BBC) this has not been the result by any means the fact that other countries, often in a similar situation, and by the fact that the supply of a juror to any given category prevents an organisation from entering more than one programme. ITV, which won the documentary section last year with Thames's *We Was All One*, were unable to compete this year as Mr. James Morrice, managing director of the BBC Television, sat on the 10-man jury.

The Making of a Natural History Film, produced for the Horizon series by Mick Rhodes and John Britain last November, is a meticulous documentation of the work of Oxford Scientific Films Ltd., a group of university zoologists turned cameramen, who construct their own highly specialised equipment to film the lives of fish, insects, animals and plants. Mick Rhodes's programme concentrated on the group's difficulties in making a film about the life-cycle of the stickleback, and included a scene in which a stickleback was famous showing in close-up a stickleback escaping repeatedly from the mouth of a predatory pike.

It was James Cameron's play, inspired by his experience of a recent heart operation (which involved the implanting of an artificial valve and a pacemaker) was selected by the jury from the 32 entries. It was a very happy balance between text, direction and acting. It is a well constructed play with a theme that has universal appeal and will reach a wide audience. It is presented in that language it is presented in. It was produced by R. D. Smith.

The jury's pronouncement gives a hint of the dichotomy which pervades the affairs of all men and women, and which is the basis of the play. On the one hand they tend to be looking for programmes which advance the art of radio and television by exploring new areas of science and technology on the ground. On the other hand, being professional broadcasters themselves, they are only too well aware that successful programmes in such a mass medium must be sold. It is so often to be debated by the ability to attract a maximum audience and large audiences are rarely captured by avant garde programmes.

Whether how brilliant and technically intricate the abilities

of a producer in illustrating the story of a—a blind orphan—little blind boy way of a Sibelius tone poem, the professional broadcaster on the jury will find his admiration for the virtuoso metaphysics tempered by the awareness that most of the real live human audience sitting out there in his slippers is not listening to the "Great Roads or Coronation Street."

Yet there was proof at this festival that technical expertise in original drama, fine character portrayal and sincere social concern can all be brought together in a programme which has every chance of winning the approval of audiences. The Swedish winners of the television drama section was such a production. Entitled *Crash*, it opened with the sight of a group of people advancing in a procession down a city street park, and the announcement: "In a little while you are going to be involved in a severe traffic accident." It then showed the events leading up to the crash and the aftermath, the investigation and traced the consequences.

Stated baldly like that it may sound banal and even distasteful. Yet the subtlety with which it was shown that motor transport now has an overpowering, and almost always obvious, influence on Western civilisation, and the accuracy with which the very ordinariness and niceness of the victims was reported—all this was enormously impressive.

Within the trends dominating the festival, the programme shown at the festival make it clear that his marriage of successful drama, social documentation, and polemic will play an increasingly large part in the work of the younger generation to a genre to which Britain contributed some early inspirations starting with *Cathy Come Home*, but I hope and have reason to believe that the Swedish prize will be awarded to a programme shown in Britain.

Radio play wins "Room at the Top" award

Two drama programmes—one on television and the other on radio—qualify for the "Room at the Top" Award in Aims of Industry's latest "Report on Industry on Television." The award goes to the programme that most clearly shows its prejudices by presenting businessmen as corrupt, lecherous, power-hungry and spiritually alienated.

The clear winner of the "Room at the Top" award was the BBC Radio 3 drama *The Final Solution*, broadcast on August 12. "This was notable

for having most of the stereotypes and also for some rather lamentable verse," says Ains.

Runner-up for the award was ITV's Yorkshire soap opera, *Headlight*. "It is criticised for presenting "a bromide caricature of a businessman in the worst possible light."

Ains criticises the three *Midweek* programmes on drugs during the last week in August for failing to mention "one of the most sinister sources of deliberate infatuation of hard drugs into the West—Communist China."

Dame Edith Evans
returns to the stage

Dame Edith Evans is to return to the theatre to star in an entertainment **Edith Evans and friends**, an evening of words and music. The programme will include excerpts from some of the highlights of her long career. The music will be played by two young pianists, Anthony Lindsay and Simon Young.

The production will be presented initially at the Theatre Royal, Brighton, for a week opening October 8 and subsequently for a week at the Richmond Theatre opening November 19.

ENTERTAINMENT GUIDE

[illegible]

WORLD TRADE NEWS

BRITISH EXPORTS

ECGD drive to promote investment facilities

BY DAVID CURRY

THE Export Credits Guarantee Department is embarking on a publicity drive to make companies more familiar with its investment insurance facilities.

A letter from Mr. Robert Fell, ECGD Secretary, will go to some 300 companies with overseas investments introducing a new booklet the Department has produced explaining the scheme.

In addition, some 1,000 companies with exports of more than £1m a year will also receive special publicity through the post and the Department is getting in touch with some 600 companies which have already expressed an interest in the scheme during its 15 months existence. National advertising in newspapers and specialist magazines is also planned.

The Department is also pointing out that it has accumulated extensive files on investment conditions in overseas countries, and it says it will make these available to companies with specific inquiries.

The scheme provided cover against war, expropriation or restrictions on remittances. The premium is 1 per cent. of the value of the investment per year. The scheme is restricted to companies incorporated in the U.K.

Since the scheme was started, some 17 companies have insured investments worth about £4m. Of a total of about 150 applications, some 88 have been agreed in principle by the Department, and the Department has only excluded six on the ground of ineligibility.

The average investment is between £250,000 and £500,000. Africa is the most popular area for investment applicants with some 70 requests dealt with or in the pipeline. Within Africa, 21 have referred to Nigeria, 10 to Kenya, and 10 to Zambia. There have been 10 applications for Indonesia and nine for Brazil.

The main customers, the Department says, are either small companies who stand to



Mr. Robert Fell

lose a great deal if the investment turns sour or large concerns for which the investment

Opportunities in U.S. seen

FINANCIAL TIMES REPORTER

MISSIONS mounted by the Birmingham chamber of Commerce to the U.S. this year have resulted in orders booked to the value of £350,000 with a further £1,425,000 expected to result from follow-up orders.

In reports just published, the Chamber recently revealed that during the 12 months before the mission to Chicago in April, the eight established U.S. exporters in the group achieved total U.S. sales of £1.5m. As a result of the mission, the ten members together hope for extra business worth £900,000. Seven members of the group booked orders during the visit worth a total of £50,000. A total of 230 business contacts were made by mission members. Seven of the ten members were seeking to appoint

is not critical in the overall scheme of their operations and which would probably go ahead with their plans whether the scheme existed or not.

The scheme has been modified so that the definition of what is a new investment is more generous. Now any genuine new addition to an existing investment is permitted instead of the previous rule that the investment project itself must be new.

ECGD takes on a commitment to go on insuring the investment for up to 15 years for amounts greater than the amount initially insured. The charge for this is 1 per cent. on the difference between the amount currently insured and the maximum permitted insurable amount. At any time the Department cannot be at risk for more than double the earnings. If there is a claim in relation to remittance of dividends that is deducted from the calculation of maximum liability.

an agent or distributor or a joint venture with a U.S. company. All seven reported success and all ten members said they had achieved the objects of their visit.

The mission to Los Angeles (May-June) stated that when the two previous Chamber-sponsored missions had visited California, trading conditions had not been good. This visit found that the picture had turned round dramatically.

The mission found that the British and the Italians appeared to have gained most from the recent dollar devaluation and concluded that California was very open to imported merchandise and there was intense competition from the Japanese.

Leicester export drive

By Our Own Correspondent

LEICESTER, Sept. 24.

THE LEICESTER and County Chamber of Commerce is to mount five export missions during the first half of 1974. The first will go to the U.S. on January 8 for a six-day visit aimed at selling high-class knitwear, jersey dresses and suits to bulk buyers in the mail order multiple stores. On February 17, the second mission flies to Syria and will take in Lebanon before returning on March 1. The Chamber says exporters have been reluctant to explore this market in the past but, as diplomatic relations with Syria have been resumed, it is expected that British trade there will improve. Japan is the most explosive growth market open to British exporters and the Leicester Chamber hopes to attract a greater share of the trade by their visit on April 19. A mission to Ghana and Nigeria will leave on May 8 and will be away for two weeks. Between June 9 and 13, the Chamber will have a mission in Yugoslavia, expanding market openings for a wide variety of products.

LLOYDS CONTRACT IN GULF

LLOYD'S Register Industrial Services has received a contract for the inspection of six liquefied gas storage tanks (two LNG, two propane and two butane) together with LNG refrigeration plant for installation at the 1100m. Das Island, Gulf, liquefied gas sulphur project.

The bulk of the inspection work is being carried out on behalf of BP Trading as agents for the Abu Dhabi Gas Liquefaction Company.

The two 82 metre diameter by 30 metre high LNG tanks will require more inspection work than the others because they are of double wall construction with an outer wall of carbon steel and an inner wall of 9 per cent. nickel steel.

ALSACE WINES

Wish to boost sales to U.K.

BY KENNETH GOODING

"WHEN THE supermarkets have finished squeezing you over a deal you are like a lemon on Monday—there is just no juice left." This was M. Jean Hugel giving one reason why the wine trade of Alsace is holding back from accelerating into the British retail market even though all the signals seem set at "go."

In spite of this caution the British drank about 25 per cent. more wine from Alsace last year than in 1971. "We should prefer to see sales rising steadily rather than have a sharp jump in one year—because who knows what would follow that?" said M. Hugel, whose company is the largest of the Alsace wine exporters.

The wine traders of Alsace can afford to take a conservative view. They can be sure of selling all the wine they produce, 100m. bottles a year on average, and they are already going ahead with plans to deal with future demand. In ten years' time the Alsace vineyards will cover 40 per cent. more ground than they do to-day. At the moment there are 12,000 hectares (about 37,500 acres) under vine and this will go up steadily to 16,000 hectares. Then there can be no more expansion. The two-mile-wide, 60-mile-long strip of land suitable for vineyards, the most northerly in France, will have all the vines it could support without seriously affecting the quality of the region's wine.

So by the mid-1980s an industry which started again from scratch in 1945 will have reached saturation point.

Within a century Alsace, on the French-German border, has changed nationalities four times. There was some compensation for the wine traders when they had to begin again after the war. Historically the region suffered from the German determination that it should not compete with Rhine wines and would instead be a producer of high-volume, low-quality wine which could be used to boost German production. A fresh start enabled the Alsace wine traders to go for quality produce instead. As a result the area has

"appellation contrôlée" status and is now accounting for ten bottles out of every 100 "AC" wines produced in France. But the Alsace wine trade is still very fragmented. Some 10,000 people are growing grapes for wine in the narrow strip where it is possible. Only 2,800

four out of every 10 bottles of Alsace wine. The wine is very popular in France but still 13m. of the 100m. bottles are exported, the vast bulk of it to Germany. Around 1m. found their way to Britain last year, a drop in the bucket when compared with the

wine taken home for drink. The U.K. shippers are Alsace wine has a very chance of getting a place in the British supermarket shelves. It is an easily understood because it comes in limited and takes its name only from grape varieties from which produced—Riesling, Sy and Gewurztraminer are the known.

At the same time its allows it to fill a gap in other French "AC" wine that their prices have not even though last week the of grapes was fixed by (Comité Interprofessionnel Vin d'Alsace) at some 4 cent. above the 1972 level should see only a 15 per rise in the retail price 1 time the wine reaches out Britain.

As M. Hugel made clear, of the Alsace wine trade afraid to get involved in sions with the supermarkets because they feel they end up with the wrong end of bargain. Those that attempted to do something found other problems. O operative which has been 1 with Sainsbury finds the supermarket group would to import wine in bulk and it in Britain. But since the law insists that all wine be bottled in Alsace, Neither have the alsace any intention of sending wine out in anything but green, 72 centilitre "flute" —a package which they gives a good indication quality of the wine, in supermarkets which ask if bottles will get a firm "no

In spite of all this an obduracy, the Alsace insist they genuinely do v boost their business with E in the words of M. Hugel you can sell wine in Engla most competitive wine in the world, you know you c your wine anywhere i world."



Grape prices will be 40 per cent. higher than last year when harvesting begins next month.

of them have 2½ acres or more. 180m. bottles of table wine sold 1,300 have up to 12 acres and only 200 have more than 12

For this reason the co-operative movement is particularly strong in the region. There are 18 co-operatives, the biggest with 1,000 members, which take the growers' grapes, turn them into wine and handle the subsequent marketing of the wine. Between them the co-ops supply about up to 45 per cent. of all the table

Polish exhortation to Britain

BY DAVID LASCELLES, EAST EUROPE CORRESPONDENT

BRITAIN was urged yesterday to even out the surplus it enjoys in its trade with Poland by buying more Polish goods and improving terms of trade. Although Anglo-Polish trade has soared during the last 12 months to its point where Poland is now Britain's largest East European trade partner, much of the growth has been in Britain's favour.

The call was made by the Polish Ambassador to London, Mr. A. Starewicz, in a speech to the London Chamber of Commerce seminar on industrial co-operation with Poland. Mr. Starewicz criticised Britain's "floodness to remove quotas on Polish imports despite a pledge to do so during the term of the

current trade agreement. He added that the quotas covered only 0.03 per cent. of Britain's imports, and that their removal need be no more than a symbolic gesture.

Mr. Starewicz also said that the structure of imports from Poland needed adjusting. It currently had too high a proportion of raw materials, semi-finished products and agricultural goods.

Lord Limerick, Under-Secretary of State at the Department of Trade and Industry, agreed that the surplus could not be maintained, though he did not mention quotas. He said that two-way trade would rise from a total of £145m. in 1972 to more than £200m. this year.

In the first eight months of this year British exports to Poland were £68m. and Polish exports a surplus for Britain of

FLOATING FAIR FOR U.S. EXPO

NEW YORK, Sep. 24.—About 500 U.S. export companies are expected to take part in a trade fair to be held in the liner Queen Elizabeth II in the autumn of 1974. Called the U.S. World Exposition, the floating fair leaves New York on Oct. 1 for a 60-day voyage with in Southampton, Ha Rotterdam, Lisbon, Athens, Istanbul, Beirut, Tunis.

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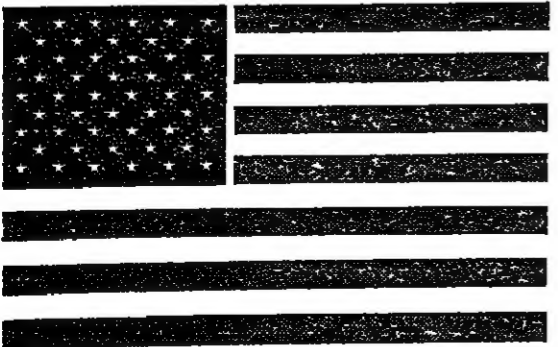
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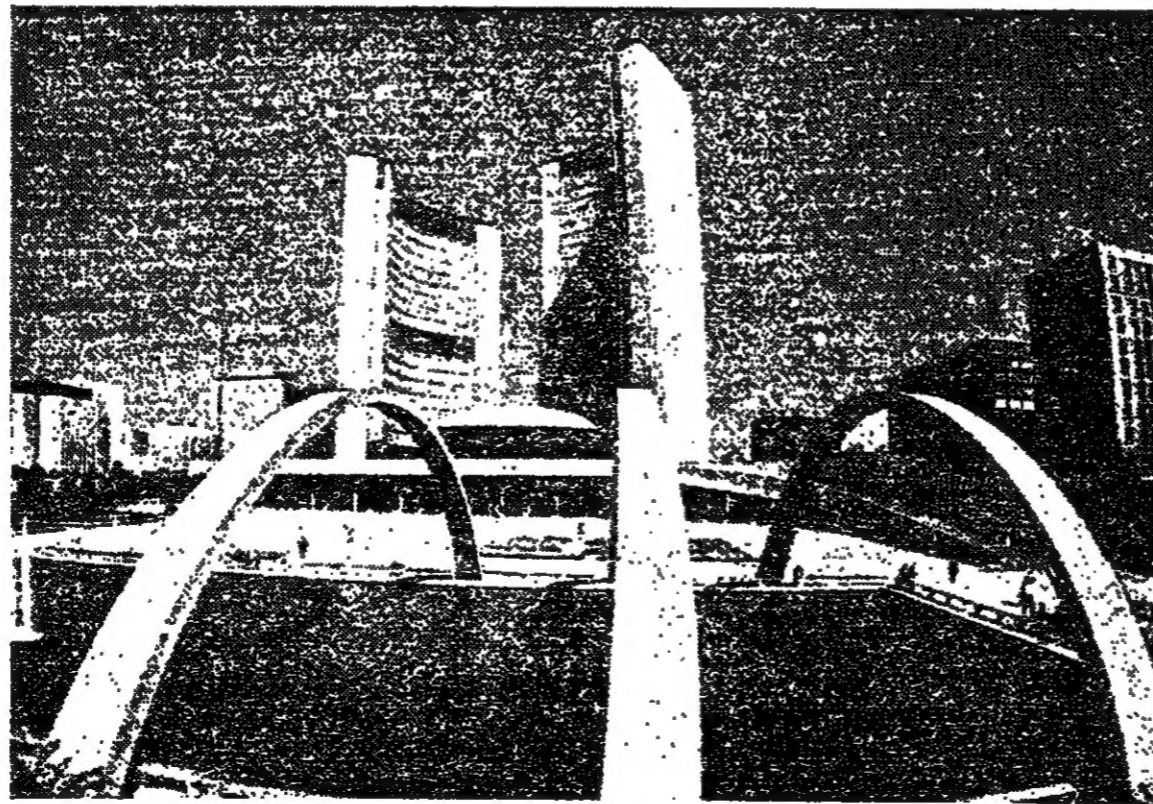
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Prospects for the vintage

ARE NOW at the beginning of another wine year, for while drinkers may think in terms of lendar years and vintages, the growing regions they count runs of campaign years. The wine harvest began in France in 1961 and during the last few years the more sophisticated of Western Europe have been aware of the fact that the wine merchants have been increasing their stocks and weighing up prospects for the next wine year.

The growers almost everywhere in 1957-58 have been at least a year financially, and in leading French areas, from *épave d'ow* to the Rhône, have again been "under the pump." This has caused a number of the merchants, faced with need to replenish stocks at greatly increased prices, to turn to the world's chief producer that one of us as Boving with wine, who have jumped sharply in the last 12 months, and only through the United States and Portugal where prices have been too low for years, the growers are obliged to pay the difference. In the United States, in *Uppin* the cost of the wine required for the fortification of port has risen too. In Germany, for output averages only 10 to 15 per cent of the French total, and the re-

Overall these only account about 5 per cent. of total it; and less in some districts. France, however, the problem of stock replacements must be particularly serious. In Chateau there is now for the first a partly free market in place of the fixed prices negotiated annually for years. All the quality and maximum prices for grapes has risen from 6.85 per kilo last year to 8.37 for the new vintage, on the market they might cost 10 francs; and it takes 1 to produce enough wine to bottle of champagne.

course no champagne is produced from maximum-grapes, but prestige houses such as Bullinger, Krug and Pommery will probably be paying prices of at least \$60 per bottle for the maximum-grape vines when they can get any grapes on the free market. We cannot expect any immediate slackening of the rise in champagne prices that has begun on for the past year.

As to the vintage prospects, although quality and quantity should be above average, no-one has forgotten 1964, when after a scarcely less favourable summer, the heavens opened during the

Results for the Year ended 31st.May 1973

	1973	1972
p Turnover	9,407,266	5,958,687
p Profit before Interest and Depreciation	1,800,838	560,356
Profit Payable	141,312	106,805
ation	123,954	96,792
	265,266	202,597
p Profit before Taxation		
e Group	674,223	321,599
ociated Companies	61,239	25,160
	735,472	357,759
Taxation:		
e Group	283,642	136,867
ociated Companies	2,506	795
	286,148	137,662
p Profit after Taxation	449,424	220,097
Extraordinary and Prior		
ar Items	64,375	8,400
p Profit after Taxation		
d Extraordinary and		
rior Year Items	384,349	211,697
t with as follows:—		
ends for the year:		
ference 71%	4,125	4,125
inary Interim 4%		
(1972-14%)	23,032	23,439
omposed Final 10.43%		
which together with the		
related tax credit is		
equivalent to 14.9% gross		
(1972-14%)	63,324	82,036
	94,301	109,800
fer to Loan Redemption		
serve	3,600	2,000

	96,301	111,800
Profit of the Year	<u>£288,348</u>	<u>£100,097</u>
Earnings per Share	19.07p	9.24p

up Trading Profit, before deduction of interest, depreciation tax, exceeded £1,000,000 for the first time in the history of Company.

Profit, before tax, increased by over 105%, while turnover also increased by 57.87%.

and Ordinary Dividend of 2.61 pence per share is recommended which is equivalent to 3.72 pence per share gross on the capital increased as a result of the recent 1 for 4 capitalisation issue.

Exports increased to an all time record of £3,502,000 which does include the Sales of our two Overseas associated companies Strong & Peltzer Tanneries S.A. Belgium, and G. L. Sowron Ltd., New Zealand.

first three months' trading of the present year compare favorably with the profit made during the similar period last year, and, unless world Leather Trade materially alters, I am confident that our Interim Statement will show a satisfactory result.

J. P. STRONG,
Chairman.

BY CHRIS BAUR, SCOTTISH CORRESPONDENT

EDINBURGH, Sept. 24.

THE FIRST berths at Peterhead Bay, Aberdeenshire, where more than £4m. is being spent to create a new North Sea oil rig service base, will be ready next month.

The entire project will be completed in mid-March, 15 months after the Scottish Office took special legislative powers to direct the development.

Mr. Gordon Campbell, Secretary for Scotland, visited the harbour to-day and praised the speed of work. He said this was the first custom-built base to be provided on the Scottish East Coast to back-up oil exploration and development.

More than £2m. has been provided by the Government towards the cost of reclaiming 23 acres of shore and providing seven service vessel berths on a 1,500-ft. quai at the south of the bay. The actions have been leased to the Aberdeen Service Company.

The first two berths will be ready for use by mid-October. Another two will follow in January, and the rest two months later. Arunta, the British Oxygen Company's subsidiary, expects to complete its £1.5m. investment in creating four new berths with warehousing, storage and heliports. The other two will be built by the Scottish Office has established a harbour company to

The Royal Society of Arts has given its 1973 presidential awards for design management to the Blue Circle Group, the British Oxygen Company, Cheshire County Council, James Galt and Co., and Paterson Products.



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THE SEVEN AGES OF MAN—MIDDLE AGE
Report by René Cusker, picture by Patrick Lichfield.
If you want to know what you're really like you get someone else to tell you. That's why we asked writer/ traveller René Cusker and photographer Patrick Lichfield to give their impressions of the world of Bayer and the way it touches on everyone's way of life, throughout Man's seven ages.



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Midland Bank

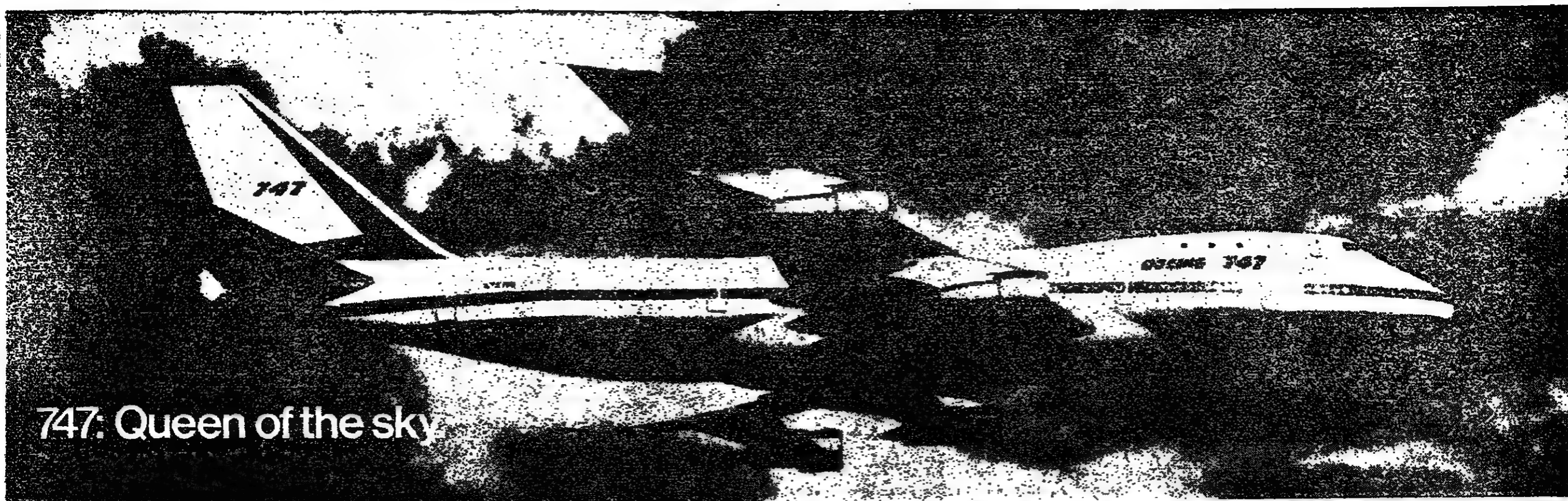
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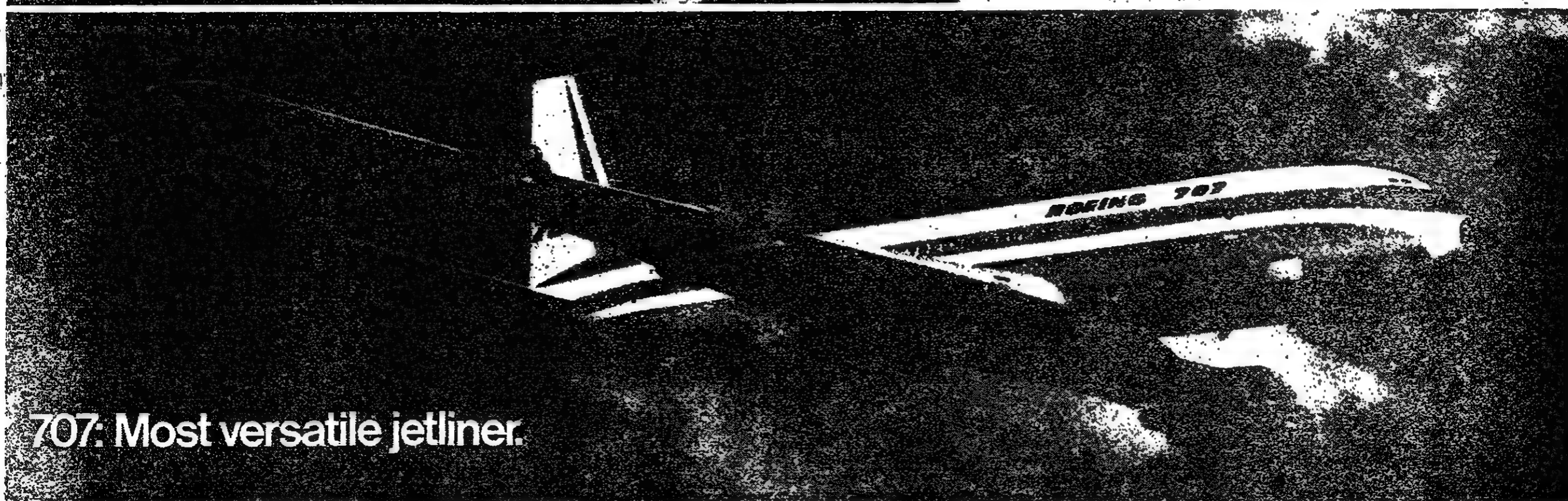
مكتبة الوطن



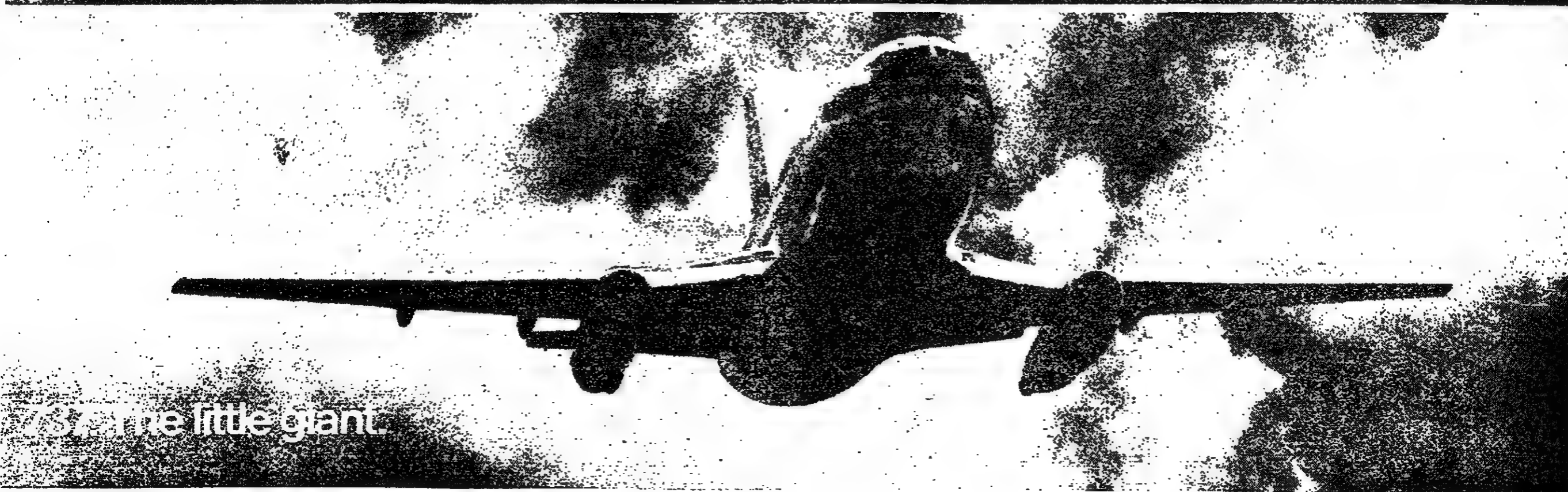
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Czechoslovakia in the throes of normality

By DAVID LASCELLES, East Europe Correspondent, recently in Prague

THE crude boards that up to keep people away from the grave on the anniversary of the Soviet invasion of Czechoslovakia is now back to normal. The y's leaders have begun to in speeches this summer the crisis of 1968 has been me and normality re-

ality of course, lies eye of the beholder, and made by Mr. Gustav and his colleagues may different meaning to west. But besides their implication that all ves of the Dubcek era have swept away and replaced by orthodox communism, the also suggest that the regime no longer feels need to the extent that a special justification to The question now is r Czechoslovakia, given d of public acceptance more confident Govern- is finally in a position to up with the progress, both ic and political, that has ade elsewhere in East during the last five

Acceptance

It should have taken so achieve normality has to do with the diffi- of re-establishing full control — which was accomplished — than

with winning acceptance at home and abroad and disentangling the large number of economic reforms introduced by the liberals.

With the benefit of hindsight, the Czech public has moved from grudging tolerance to the realisation that it was futile ever to have expected the Prague Spring to last. Indeed, it is quite common in Czechoslovakia these days to hear Dubcek condemned by his former supporters for the way he handled the reforms. And, resignedly, most people have turned to pursuits other than politics to ensure their lives.

The exceptions have been among the intelligentsia, though even here the Government has been able to mount a conciliatory campaign with some success. Although no official figures are available, it is now reliably estimated that 90 members of the 360-strong Dubcek era Writers' Union have joined the recently re-constituted union. One reason may be the dropping of the requirement that "reformed" writers issue public recantations, though a spectacular exception was Dr. Miroslav Holub, a biologist and poet, who signed the 2,000-word Manifesto on Human Rights. In a public statement Dr. Holub recently renounced his former views and condemned critics of the present regime.

An official figure that is available is Communist Party membership. This is currently given



Dr. Gustav Husak

Far-reaching

The task of clearing away the Dubcek economic reforms has attracted less publicity than the political normalisation, but has, in its way, been no less far-reaching. The reimposition of central planning and control is now complete. This has entailed an enormous amount of reorganisation and new legislation, including the drafting of new statutes for organs like the Commercial Bank and the restoration of a monopoly in foreign trade.

But the Government's trickiest job has been to eliminate the price patterns that evolved during the market-oriented reforms of the mid-1960s and impose a pattern conforming more closely to new economic and social policies. The Govern-

ment had frozen prices after products and, worst of all, beer, the invasion and only managed to get round to unfreezing the how little the people trusted last of them this summer, their rulers, became so rife that Although the new structure the Government was forced to saw most food and catering prices go down and luxury items go up. Czechoslovakia had been seething with for illegal refugees, but there rumours for weeks that Mr. Husak was planning to increase the prices of many household

normally permitted in East Europe. There has, however, been a degree of covert liberalisation over some cherished rights, like travel. The consular departments of western embassies in Prague are now reporting a spectacular growth in applications for visas—and applications are only made by people who have already obtained permission to leave Czechoslovakia. Most of the growth has been in group—therefore supervised—travel, but the number of individual travellers is also increasing.

There has also been a marked improvement in the standard of living, though quite how it has been achieved is something of a mystery. The Government denies that the people are being bought off with consumer goods and housing and claims, ironically, that much of the present prosperity is due to investments made before it came to power—in other words, by the liberals.

Trade policy

The picture of the economy presented by official figures shows an emphasis on heavy industry, chemicals and glass and china, all of which are growing at over 8 per cent. a year, reflecting the Government's foreign trade policy of developing selected manufacturing sectors with good export prospects. By contrast, the consumer goods industry is growing

at only 4.9 per cent. and food processing at 5.4 per cent. Similarly, consumer goods only account for 15 per cent. of total imports while officials estimate the country could afford to raise the figure to 25 per cent. But the material prosperity is unimpressive, and one possible reason is that Russia has deliberately reduced its orders to console the Czech public.

Living standards are also being helped by the flow of new housing at a rate of 100,000 flats a year (though accommodation in Prague is still critically short), and increased social benefits and payments. Wages are also rising, though not much above the East European average. A new type of loan to help young married couples was introduced on April 1. Within three months the equivalent of £26m. had been taken out.

There is also uncertainty about how the Government is financing these improvements. No loans similar to the ones granted by Russia to Poland after the 1970 riots have been announced — though that does

not mean there has been no direct help. But the comparatively smooth growth of production seems out of proportion to the sharp and visible growth of wealth. Mr. Ota Sik, the man responsible for economic matters under Dubcek and now in exile, claimed recently in a Vienna newspaper interview that the Czechoslovak boom had no solid economic foundation, ably reluctant to learn.

He argued that money which should be going into capital investment was being used for pampering the public and that these distortions would soon make themselves felt.

But though hard-liners still loom over the Czech scene, reminding people that they can be thankful for Mr. Husak's moderate line, the eyes of many Czechoslovaks these days are directed not at Prague Castle but at the Kremlin whence the ultimate command must come. Meanwhile, though, the West's Security conference for greater contacts between East and West are important to the Czechs who have fallen behind the general East European movement towards economic reform and liberalisation as a result of their crisis. Neighbouring Poland and Hungary, for instance, are experimenting with economic decentralisation and have even steps which have sparked public interest in a way that contrasts sharply with apathy in Czechoslovakia.

ointments

ohn Camden to lead Ready Mixed

ohn Camden is to become n of READY MIXED ETE at the beginning of ar and will combine the th that of chief executive, at present managing

r. R. Northcott is to retire rman on December 31 to more time of his interests b West England.

William J. Emmerson has pointed as a director of UCRON SCOTLAND, the opany formed by Charcon, idlary of Charterhouse

L. Jenkins has been managing director of A. KRIS & KASTNER

U.K. The appointment follows the decision by the German based parent company, Gardena GmbH, to market direct to the U.K. instead of through an agency.

Mr. William Griffiths of the Hartford group has been appointed director of general underwriting for the EXCESS GROUP and Mr. Peter Gerrie has become director of claims. Mr. Jeffrey Slocumbe has been made accident, line of business, manager.

Mr. Thomas Muleahy has been appointed manager of the London office of Allied Irish Investment Bank which will open next month. He was previously loans manager at the Bank's head office in Dublin.

Mr. R. J. Davidson has been appointed a director of ESTATES AND GENERAL INVESTMENTS and has also joined the Board of its two subsidiaries Eagle Trust Company and Unitholders Provident Assurance.

Mr. R. W. Hobbs has been appointed a divisional director of the building division of JOHN LAING CONSTRUCTION.

Mr. Anthony Roper has been appointed company secretary and group accountant of BRITISH AND CANADIAN INVESTMENTS.

Mr. Bruce Moyle has been appointed chairman and managing director of H. J. GREEN & CO., a subsidiary of the Pillsbury Company of the U.S. He succeeds Mr. Grahaime Francis who has taken up a position in the U.S. within the group. Mr. James Jensen has become marketing director of H. J. Green.

Mr. J. Gray, a director since 1947 of the Bowley Group, has retired.

Mr. R. G. Thompson will join the Board of BAIN DAVES (Reinsurance Brokers) from October 1 as managing director. He will continue as a director of Bain Daves (International) until December 31.

Mr. Stephen L. Finch has been elected chairman of the STEEL CASTINGS RESEARCH AND TRADE ASSOCIATION. He is a director of the Weir Group.

Mr. Brian Goldsmith, formerly sales manager of REINFORCING BARS (BLAYDON), a Romag Group company, has been appointed to the Board as sales director.

Mr. R. A. Wall has been appointed managing director, and Mr. M. Martin (secretary) and Mr. R. A. Colmer (sales manager) have been appointed directors of KEATRON INTERNATIONAL with effect from October 1.

Mr. J. P. Matthews, who was recently appointed managing director of John Lewis, Oxford Street, has resigned from the Board of SUBURBAN AND PROVINCIAL STORES, a subsidiary of John Lewis and Co. Mr. R. D. R. Probert, who was the John Lewis Partnership's central buyer of gifts until his retirement, has also resigned from the Board.

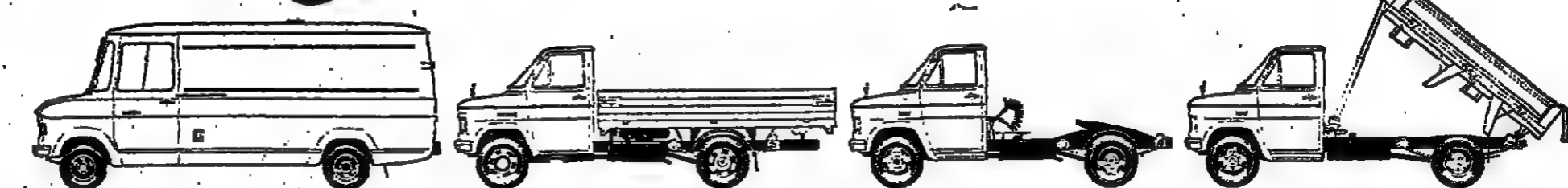
Mr. Colin Bash, general manager of SEABOARD PIONEER TERMINALS, has been appointed to the Board and becomes managing director. The company is jointly owned by Reed International and Seaboard Shipping Services.

Mr. J. Stuart Hanson has been appointed by MIDLAND CATERING as a director for its Northern Division. Mr. Edward Cieszkowski has been made a director for the South of England.

Mr. Carsten Halvorsen has been appointed managing director of AMCEL CO. SCANDINAVIA following the move of the European managing director, Mr. Lawrence F. Bond from Scandinavia to the new Amcel headquarters in Watford, England. Mr. George Janssen has become a director of Amcel Watford, in addition to his present directorship of Amcel Co. Scandinavia.

Ford's Go-Between.

The new 'A' Series Light Truck Range.



For too long there's been a gap in the range of trucks you can buy. It lies between 3.5 tons and 5.5 tons GVW. And it could be a gap in your business.

Now Ford has filled that gap. Not with a one-off special, but with a complete Light Truck Range. Look at the selection it offers.

There's an 'A' Series Integral Van with dozens of body and door variations, a Float, a Tipper, and an Artic (at 6.5 tons GCW). Plus a Chassis Cab, Chassis Windshield and Chassis Cowl. Plus specials, to order, from bodybuilders. So you're bound to get the truck that meets your needs exactly. Some models have 14" wheels, some have 16". With a choice of four engines, four wheelbases, a 4-speed gearbox with synchromesh on the top three, or optional

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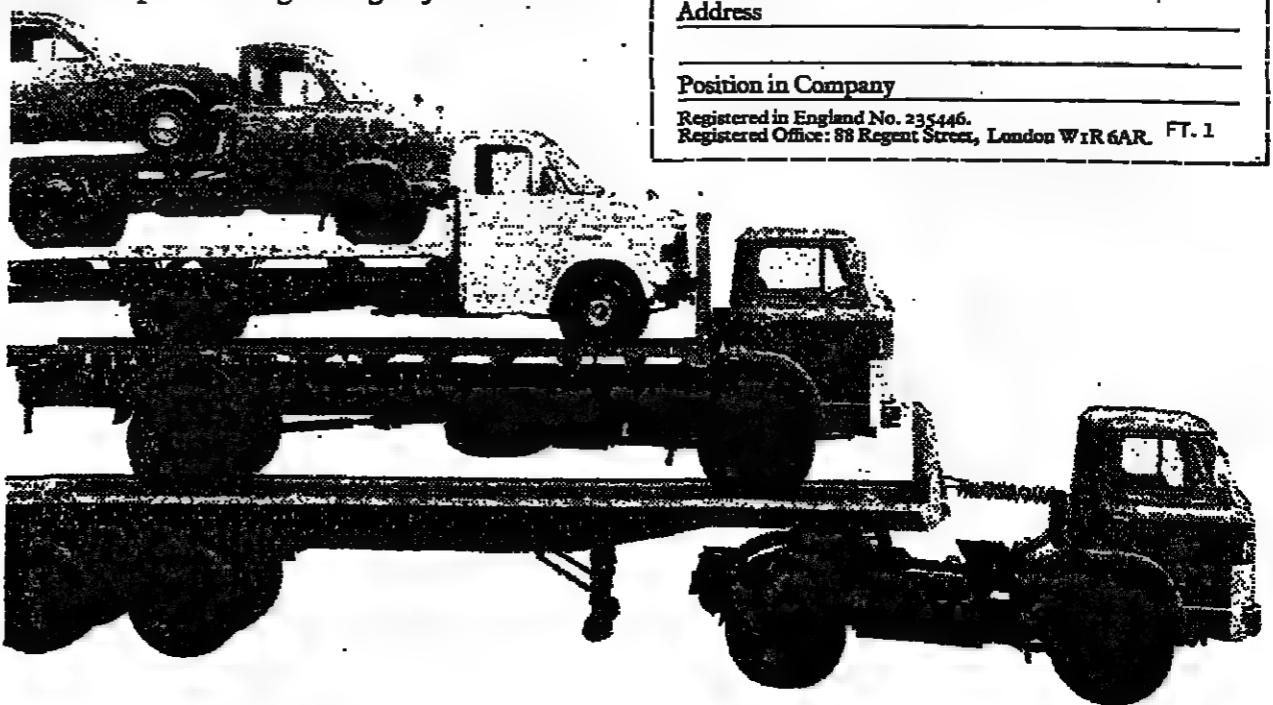
To discover which Go-Between is right for the places you need to go between, first fill in the coupon. Then go along to your Ford

Truck Specialist Dealer for advice. You'll easily spot the 'A' Series. It goes between the Transit and the 'D' Series. Send the coupon to: Ford Motor Company Ltd., Dept. 75, 40 Berkeley Square, London W1X 6AD.

Please send me post haste the fullest information on the timely new 'A' Series Light Truck Range. Mail to: Ford Motor Company Ltd., Dept. 75, 40 Berkeley Square, London W1X 6AD.

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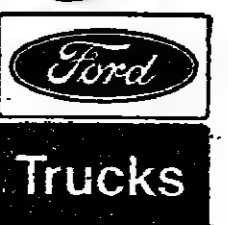
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Political deadlock on monetary changes

In the second place, there is no mistaking the dismay of the British delegation at the deadlock on monetary reform. If Mr. Amos Barber, the Chancellor of the Exchequer, has been most urgent in pressing for agreement, it is partly because the world system needs reforming, partly because even a constructive move forward at Nairobi could have helped sterling and alleviated some of the difficulties of Phase Three of the anti-inflation policy. Mr. Shultz may be right in claiming that the monetary reform glass is half full, not half empty. But in Nairobi this week he has won no new friends in the British Treasury.

"The Chairman said under no
circumstances would he be moved.
So we left him behind."

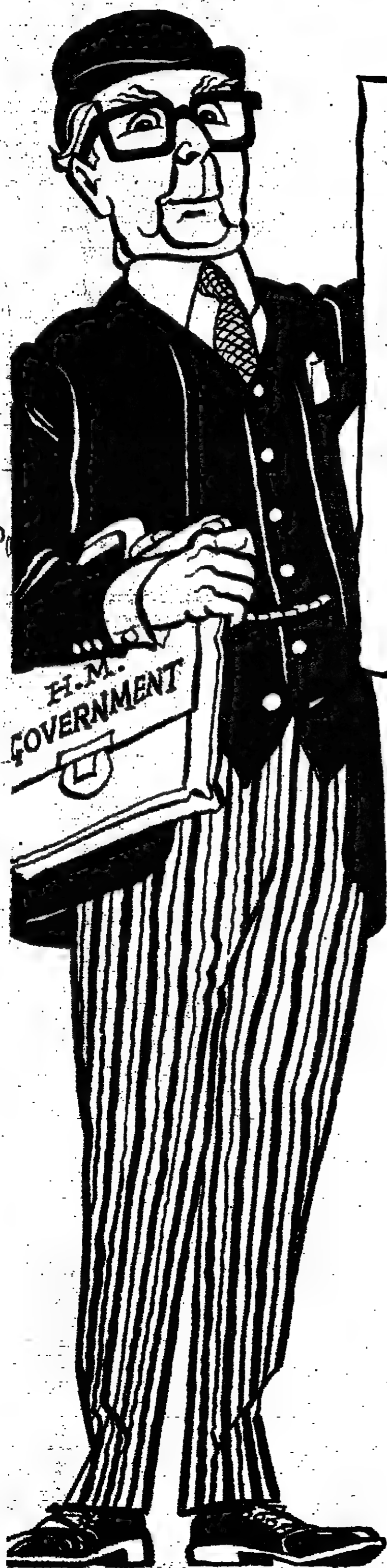
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Employers!

Seven questions the Government will be asking you.



- 1 Do you have a Company Pension Scheme?
- 2 Does your scheme cover all employees over 21 and under normal retiring age?
- 3 Does your scheme provide sufficient pension to meet the new requirements of the 1973 Social Security Act?
- 4 Does your Company Pension Scheme provide benefits for widows?
- 5 Is there any protection against inflation?
- 6 Is the scheme adequately funded?
- 7 Does your scheme preserve pensions for employees who leave service?



If you have to answer NO or DON'T KNOW to any one of these questions then NOW is the time to take action. If by April 1975 you don't have a company pension scheme which meets certain minimum requirements you and your employees will automatically fall into the State Reserve Scheme.

If by April 1975 you can answer YES to all the Government's questions then you and your employees will get the benefit of a Recognised Company Pension (RecomPension for short)—and you will not have to join the State Reserve Scheme.

A RecomPension Scheme will be run by you as an employer to standards laid down by the Government.

Now that a second pension is to be everybody's right, progressive employers will be looking for ways to build additional benefits into that second pension. The sort of benefits that only a RecomPension can offer.

The advantages of a RecomPension Scheme

Higher pensions, more security for dependants, freedom to take a lump sum, early retirement in suitable cases.

These are the advantages that a RecomPension Scheme has over the State Reserve Scheme. This is because a RecomPension Scheme is flexible. Designed specifically to meet the special needs of your company and your employees.

It will probably cost you more than the State Reserve Scheme—but who nowadays can put a price on good industrial relations?

What you should do now

If you had to stop at the first question in the table, contact your advisers and find out how you can introduce a RecomPension Scheme.

If you have a Company Pension Scheme already then your advisers will be able to tell you whether or not your scheme will qualify for recognition. Consider your position carefully now so that when they approach you, you're ready to act immediately.

The decision you make now will affect the pension rights of your workers for years to come.

A life's work deserves a

RecomPension*

*Recognised Company Pension

A Recognised Company Pension (RecomPension for short), is a name given to a company pension which meets the new Government standards for pensions set out in the Social Security Act 1973. You can learn about RecomPensions from your usual advisers, or from the sponsor of this advertisement, the Company Pensions Information Centre, 7 Old Park Lane, London W1Y 3LJ.

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Friends' Provident Life Office
Guardian Royal Exchange Assurance Group
Legal & General Assurance Society Ltd.
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Netherlands Union Insurance Group
Pearl Assurance Co. Ltd.

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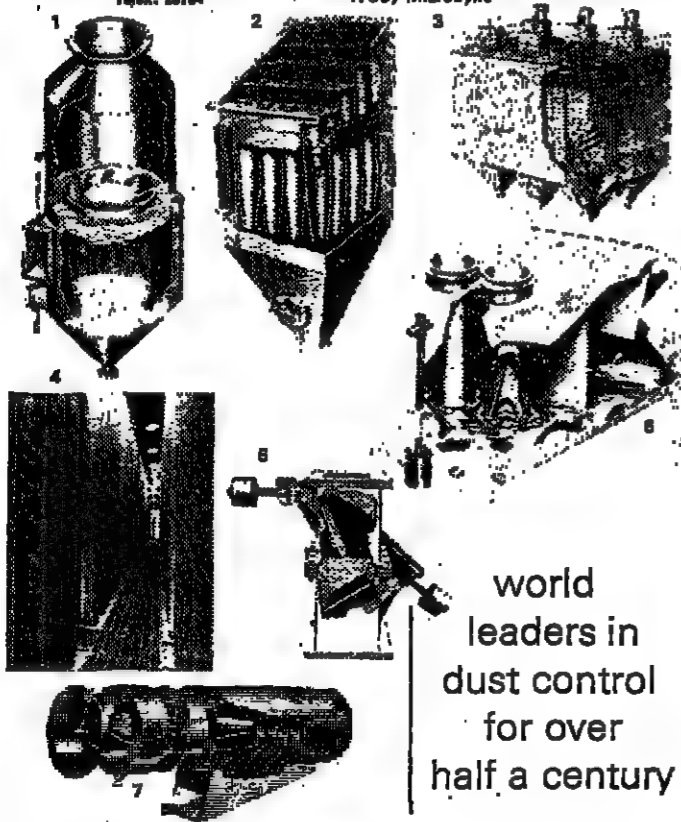
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2. Multistage Mechanical Collectors
3. Electrostatic Precipitators
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5. Dust Valves
6. Turbulence Gas Scrubbers
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FILTRATION

FINANCIAL
TIMES
SURVEY

Industry's growing demand

By TED SCHOETERS

Separation and filtration—powder technology.

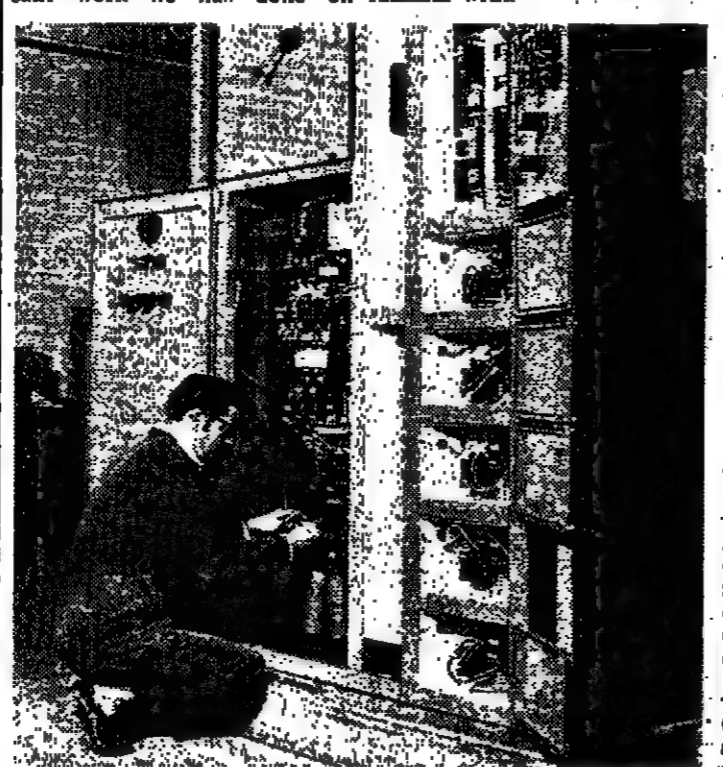
This paper, very briefly stated, indicates that the performance of any screen (sieve) with any powder can be computed mathematically from existing formulae. This prediction of efficiency has not been done before.

Old as the traditional separation methods may be, few alternative processes have appeared so far to challenge them and the only one that springs readily to mind is the sol-gel and gel precipitation group. Developed at the ceramics centre, AERE in the materials preparation unit, they are applicable mainly to ceramics and provide powders of closely controlled particle shape, size, density and composition. They eliminate any need for the lengthy and energy-consuming processes of comminution and sieving.

Brilliant scientist

That there may well be a case for serious consideration of such a proposition is demonstrated by The Filtration Society itself which recently said that although sieving and screening are two of the oldest manufacturing processes known to mankind, "there is a mystery about the exact way in which they separate particles into different sizes."

Dr. J. E. English, the Society announced, had come up with a new theory after studying the mechanics of the process and this work had won him The Society's Suttle Award. The recipient is a brilliant materials scientist who now is well known for the eight years of significant work he has done on this way.



An engineer works on panels for the control of a big dust extraction system. They are produced by Newman Electrics of Birmingham.

There will be no lack of new equipment at Filtech/73 at Olympia to-day and in many existing units, new materials recently available to the filter makers are being applied to provide better performance. Overall, certain trends seem to be emerging. One is that filter units, for instance, are being presented with more closely guaranteed performances. Another is the appearance of materials which not only trap unpleasant smells but also destroy their agents by catalytic action instead of releasing them if the ambient temperature rises above a certain level.

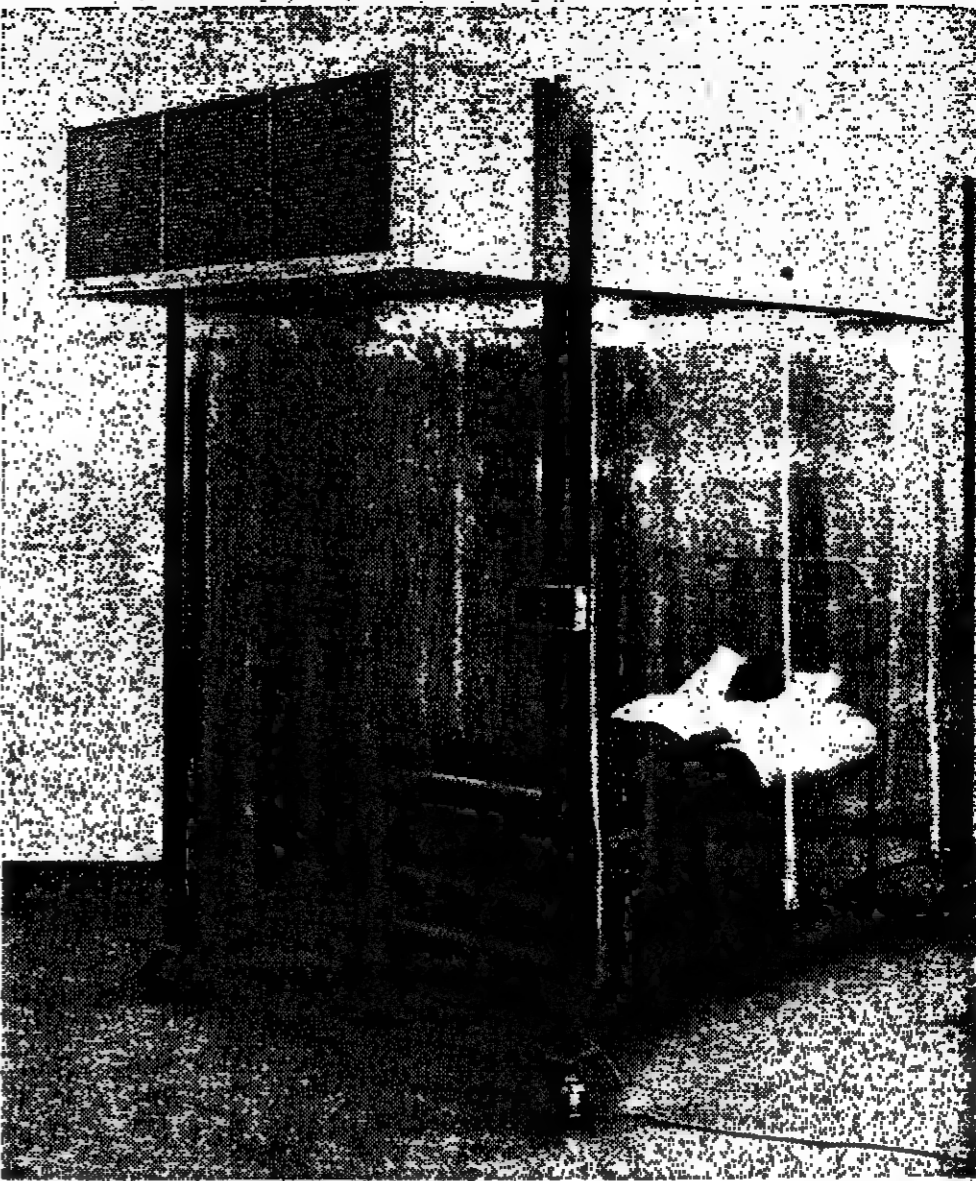
Low gear

One of these, embodied in the Apsee Air Charger, has been put to an even more stringent test on behalf of the Southampton Docks Board and was found to stop all sulphur dioxide, reduce carbon dioxide to one-twentieth and carbon monoxide to one-fifth. The intention is to provide relief for Customs Officers who have to work for a large part of the day in sheds where the air is heavy with the fumes of vehicles running in low gear when boarding or leaving the ferries. The innovators claim their system to be much cheaper than conventional ventilation or extract systems and to avoid the red tape of planning permission.

In the same area of application is a catalytic filter medium which will operate in temperatures from as high as 90 degrees C to below freezing. A German development is incorporated by Improvac in filters of various types, it will cope effectively with such particularly difficult substances as butyric acid, chlorine, formaldehyde and the all too prevalent sulphur dioxide.

While contaminants like these are dangerous to human beings over a period, others such as salt sprays can be the cause of serious accidents due in the first place to corrosion. Here, adequate filtration can play an important safety role, particularly now that the gas turbine is becoming an essential part of the equipment of the big drill rigs and also is being much more widely used in marine propulsion. Gas turbines gulp immense amounts of air and salt micro-mist ingested with the air can cause sulphate corrosion in hot zones as well as electrolytic corrosion, when it comes into contact with interfaces where dissimilar metals mate.

To solve this problem, Separation Systems (Begg, Cousland Group) has produced a three-stage process to remove sodium chloride from the air fed to turbines to such an extent that only one part in one hundred million by weight is salt. Demonstrated in the laboratory, the equipment



This mobile modular unit provides a sterile atmosphere round a hospital for the treatment of burns and other serious illnesses. It is designed and manufactured by Envair (UK) Ltd. of Haslingden, Lancashire.

is being fitted as standard on a number of Vespene frigates for temperatures well above boiling point can be handled as can most mineral and organic acids, alkalis, acidisers and salt solutions.

Military devices

There is a growing demand for controlled environment working in many industries but particularly those involving the assembly of complex electronic and electro-mechanical equipment for the computer industry, military devices, aerospace equipment and the fine chemical and pharmaceutical world. For such applications there is a wealth of new ideas, even extending to the provision of "instant clean rooms." Demand for better pollution prevention, that is, justified demand divorced from the environmentalist's lobby, is also making itself felt. An illustration of this is the Chemico (Aerofet) process to cut emission of gas and dust from steel converters to a minimum.

This is done by blown oxygen through the as vessel, but virtually seal the mouth of this vessel moveable hood to reduce intake, removing exhaust and treating them by residual burning and so on. The gain to the environment is obvious. Not so obvious gain for the steel maker this calculated at one per greater yield, lower maintenance costs and lower power needs. Even the from the scrubbers is a form of highly divided oxide and thus easy to handle. This is one of the few instances where a new process is at one and the same time less burdensome to the environment and economical to apply. Nevertheless, the pressure on the environment is a force industry to more and more heavily on the of the filtration and air ing sections of the engineering group.

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RATION II

Automatic air monitoring must come soon

McELROY

long us fortunate a plant instruments are to suffer from hay degree, protected. They can be thma are a living serviced and inspected regu- the insensitivity of larly and they are generally an organs to air- immune to tampering.

Instruments that are to be located in public places, though, are open to accidental and deliberate damage. Not only must they be fool-proof, they must be vandal proof.

Small changes

Designing an instrument that is sensitive to small changes in air-borne particles while being immune to the slings and arrows of outrageous hooligans is no easy thing. There have been many attempts in the past, and while few could be faulted in measuring performance, still fewer could stand up to the rigours of a very public life.

In recent years one or two designs have shown themselves capable of this duty. They are accurate, tough and reliable. Some are even now being used in Britain and on the Continent for air monitoring duties. Few, as yet, form part of an automated detection and warning system.

Overall system reliability has proved a deterrent to pioneers. If a system is to be useful, it should be able to read data from a network of distributed sensors into a computer, where it will be analysed to identify the nature of the pollutant and pinpoint its source. Even with in-day's technology, and especially computer development, this is still no easy matter. There are far too many variables affecting the drift and settlement of particles.

In Holland, Philips has set up such a network as described. Various sensors, including infra-red and microwave, are used and the information collected on a central computer.

A special program written into the machine assesses the degree and type of contamination and by combining the differential readings from the sensors it is able to alert the staff of the centre to unacceptable levels of emission and tell them which factory chimney is responsible.

Pioneering work on this scale deserves credit. But the Philips staff concede that, while the system works fairly effectively, it is not the ultimate answer and can still produce misleading results—despite several years of refinement based on practical use.

One comment that has been made about the monitoring of pollutants is that to be really effective it should be done on a continental scale, and should be able to take into account climatic variations. This does not mean only wind speed and direction, but also variations in temperature across the moni-

tored area and levels of rainfall which, of course, bring the pollutants to the ground.

Several papers have been published setting out in detail how such a system could be organised, but there is a long way to go. Before any start could be made there would have to be international agreement on acceptable levels of pollution by airborne particles, standardisation of measuring techniques, and a common way of interpreting results.

Technically, there is no problem that could not be solved given adequate funds but previous attempts at international co-operation on this highly emotive subject have shown that human problems present a much greater obstacle.

On both sides of the Atlantic interested bodies are examining possible methods of setting up automated atmospheric watch-dogs. Best known in Europe is the Philips scheme, but here in Britain the Warren Spring Laboratory has been amassing experience in using different types of sensors and in interpreting readings.

On a smaller scale industrialists, individually, are worried about the difficulties of measuring the degree of pollution they cause. Cynics might say that they would rather take action than be caught out by a public authority, but over the last three years there has been a sincere concern in industry that it could do more to ensure that its neighbours breathe clean

talents and facilities hidden away in our universities they now offer a comprehensive advisory service on monitoring and control of effluent, covering not only airborne particles but gaseous and liquid effluents as well.

It claims that, since it uses academics, its advice is completely independent of any manufacturer of hardware.

Two attitudes are common when airborne pollution is discussed. One is that clean air is the sum of many individual efforts by industry, while the other maintains that nothing less than a complete public monitoring system, backed by stiff legislation, will suffice.

In the event, it is probably the latter policy that will be adopted, but the cost and complexity of a network that will identify and locate the source of airborne pollutants on this scale dictates that it will take constant pressure from interested bodies before central government, or even local authorities can see their way to sanctioning such a scheme.

Different options

Yet how many companies have the staff or resources to look at all the various options? Giants like ICI, BSC and the electricity authorities can and do, effectively. Further down the scale the worried managing director can turn to a public body, like the Warren Spring Laboratory. But while its scientists are generous with their time and advice, they cannot undertake the design of separation systems.

Several years ago a company called Environmental Resources was established to provide just this sort of advice. Using the

and to 0.45 grammes per litre by the end of 1975.

When this statement was made to Parliament by Mr. Peter Walker, then Secretary of State for the Environment, heavy emphasis was laid on three points: that the motor industry had been fully consulted, that the reductions would not prevent production of Five Star grade petrols and that the only effect would be an overall production cost increase of 1p a gallon, and finally that the Chief Medical Officer of Health had advised that the 1973 level of lead emissions in the U.K. did not present a danger to health, but should not be exceeded. Because of the continuous growth in the numbers of vehicles in cities it was already clear that the level undoubtedly would be exceeded in the near future and probably long before filter systems could be brought into use in sufficient numbers by legislation, or other means, to counteract the trend.

These filter systems, including one by Associated Octel, the tetra-ethyl lead producer, had already been shown to remove between 70 and 80 per cent of lead emission by filtration/chemical action and thus would have more than achieved Mr. Walker's aim for 1975 if they could have been produced and fitted fast enough. At the time, Tube Investments was setting up a pilot plant to make 50 units a day—a mere bagatelle compared with that company's 8m. a year of all types of silencers—so the major manufacturer was clearly prepared to try to cope.

But the problem was not the relatively simple one of switching production. Europe had already gone much further than Britain in adopting legislation on exhaust emissions. German action on lead was significantly more severe. The 1972 level already was at 0.4 grammes per litre of petrol, lower than the 1975 target in Britain and when the U.K. motorist is buying top grade petrol at 0.45 gm. in 1975, his German counterpart will be unable to obtain fuel with more than 0.15 gm. of lead per litre.

Translated into a tonnage, this would mean 10m. extra tons of petrol a year, with a corresponding jump in expenditure for the individual motorist due to higher consumption and price.

Translated into a figure for refinery modifications and new construction at Common Market (six countries) level, the 0.15 g/litre limit for premium and regular grades has been put at \$470m. rising to as much as \$1,580m. for oil lead. This is about in line with the \$200m. a similar operation would cost in Britain.

The situation and anticipated developments pose a number of important questions which must not go by default. It seems to have been generally accepted that it is not possible to combine filtration and chemical trapping of lead with catalytic action on other exhaust pollutants, satisfactorily or economically, and still meet overall exhaust emission norms—dictated largely by the State of California.

Stumbling block

But is this in fact so? The basis of one British lead trap is cheap enough—wire wool coated with alumina and substituting for an ordinary exhaust system. Surely the real stumbling block is the unpopularity with politicians and the public of any legislation which touches "the car," because, of course, legislation would be required to make lead trapping quickly effective.

It is quite a different matter when the public itself, through the trades unions and the Press, becomes greatly exercised over specific cases of pollution by a poison such as those at Avonmouth and in Southwark, London.

These cases which became public knowledge after trade union action early last year led to a detailed enquiry after an amazing parliamentary somersault. In a brief 24 hours after the company owning one plant had been cleared by one Minister speaking in Parliament, a second Minister rose to announce the enquiry.

A year later, after the Winderup Committee's investigation and an examination of conditions in dwelling areas around a London plant, a new health code for the industry was released.

It is intended to ensure much tighter control of lead dust and fume emission than hitherto and is a complex document covering many areas in industries producing or transforming the metal, including the actual methods of manufacture.

Fume control and atmospheric cleaning are considered and there is scope for air purification equipment makers to provide new installations wherever lead is handled industrially. Since it was published as recently as last August, not enough time has elapsed to analyse all the consequences.

The code was prepared by a big working group including people from the Factory Inspectorate, CBI, TUC and employers' associations.

The need for it and, indeed, the whole lengthy process of complaint, investigation and codification, would never have arisen if better monitoring and air treatment procedures had been observed from the beginning. Perhaps this calls for more pressure everywhere in industry from the associations representing the makers of dust control and air handling equipment, if only from enlightened self-interest.

The dangers of lead pollution

By TED SCHOETERS

Of the 234 patents briefly reviewed in a newly available series of abstracts devoted to automotive exhaust control, by redesign of silencers or addition of catalytic equipment, only three specifically refer to lead. In each instance these are systems where lead particles are filtered out in one way or another before the stream of exhaust gases passes over the catalyst which removes oxides of nitrogen, eliminates carbon monoxide and/or unburnt fuel, or otherwise treats the emission.

Of course, lead particle removal will be implicit in many more of the systems but it is significant that so little is said of this particular problem after the considerable public outcry of late 1971 and early 1972. This outcry resulted finally in Ministerial action to reduce the leading of petrol from 0.54 grammes per litre at the time to 0.55 by the end of this year

and to 0.45 grammes per litre by the end of 1975.

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Major importance

This development—remembering the influence of the German car industry in Europe as a whole—is of major importance, because if generally adopted in Europe by the middle of the decade the German norm would entrain a whole host of expensive consequences.

European consumption of petrol would be forced up by an extra 8 to 10 per cent, over and above what the current headlong consumption increase is bringing and at a time when the threat of shortages—politically induced or not—has never been more acute.

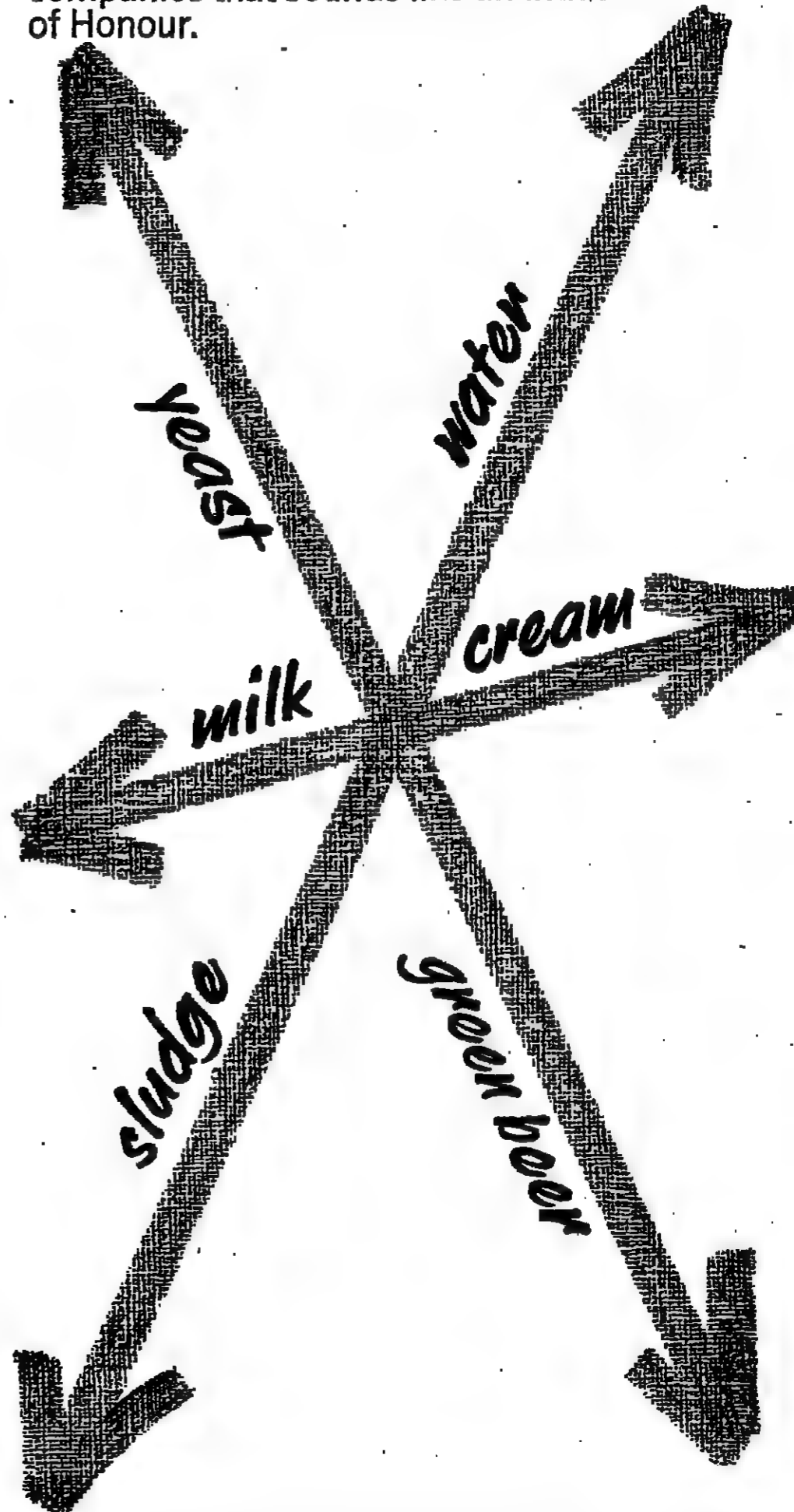
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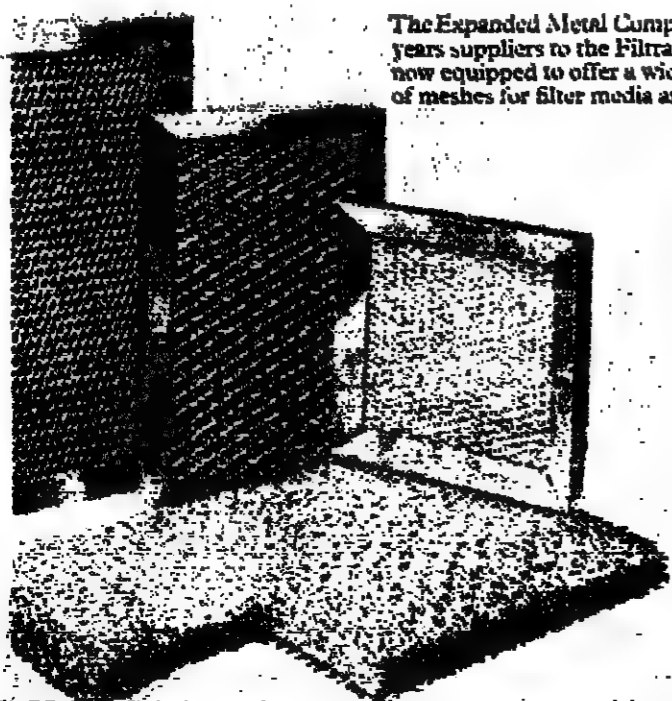
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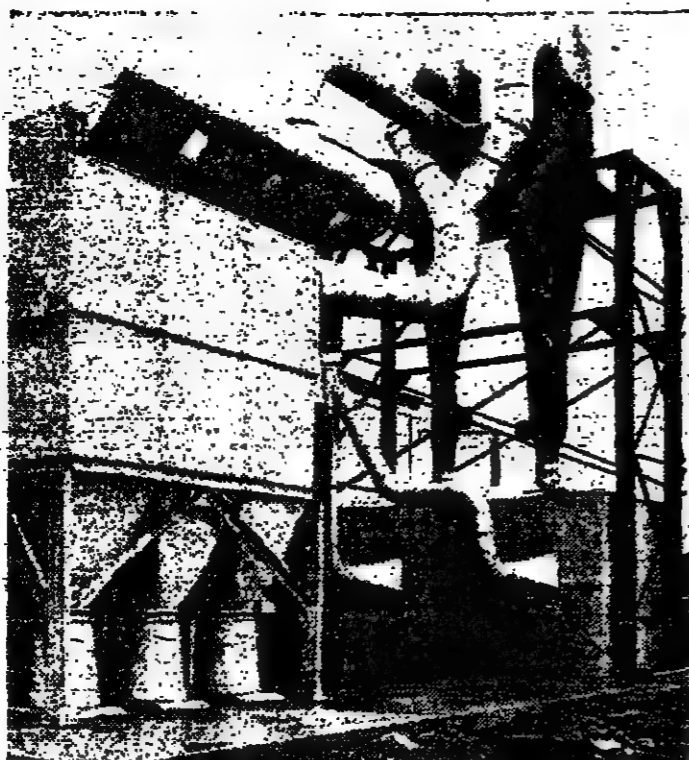
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Complex problems for big plants

As a general rule to the bigger the plant the pollution probably much depends plant is producing and ents result. However, what a plant is producing larger the plant the will be the cost of its ion measures. And, perhaps, in real terms, plant factor.



ad by a clear margin
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stry, followed by iron
and chemicals. Next
re petroleum, cement
rrous metals. So
i indication that at
g that period the big
l the big problems,
i terms of how much
ost them to cut down
lution to overall air

has been shown that sulphur dioxide are main pollutants in the list of these two has priority in Britain. The industries quoted count by any means smoke and sulphur fumes (domestic coal) as the clean air accounted for a great interest to note of their considerable expenditure on the project the 10 year period 1971-80, was spent on electricity industry.

te publication that capital expenditure falls that in 1958. emissions in Britain 2.01m. tonnes and oxide emissions. Equivalents 1968 show smoke at 1.7m. tonnes and sulphur 1.7m. tonnes. If one of industrial and population growth is period then the impressive despite overall increase in oxide emissions, and to think what the old look like if the

hospital operations in clinical cleanliness

ORAH WAROFF

artificial hip joint operations as performed at St. Joseph Hospital, near Chicago, and the systems used at the Hip Surgery Centre in London, at least 50 times in that of a good operating room in London, by deciding whether a filtered re began at Wrighton. The impetus for the clean, around-implantation was on frequently means in this kind of. While surgeons, of ways to fix for non-operative infection instances can be are up with little hip joint implant the only recourse is the prosthesis leaving the patient stricken leg and on life. Still, even the best of patients the operation turns to end up no worse usually in less pain. In air methodology at Wrightington and ring adopted around is simple but the impressive. Thirteen when hip implants in an ordinary theatre the infection 5 per cent. To-day, rate is down to 0.5 Wrightington, routine class box, eight to ten

big process plant industries had not spent so much money on anti-pollution measures. However, it must be remembered that smoke and sulphur dioxide are not the only enemies and many large process plants are handling different problems.

For the big process plants, the operator the problems of meeting current demands for air and pollution control are many and complex. Every plant is different, even every location in terms of topography and weather is different, and factors such as the close proximity of another kind of process plant or another different emissions which may interact have to be taken into account. All these aspects mean that anti-pollution measures involve much more than just design and installation of a given item for a given type of plant.

The first step, of course, is to identify the pollutants themselves and then to discover to what extent they can be contained within the plant. In taking steps to contain them, management is faced with the inevitable problem that technologically it is frequently possible to contain the polluting materials so that barely anything is released to the atmosphere. However, the cost penalty may mean that the plant would just not be viable at that level of pollution containment. It is a difficult tightrope to walk, where there's a possibility the brass is probably as true to-day as ever.

Another factor that always has to be considered is the possibility that measures to re-

duce air pollution through emissions from a particular plant may produce other discharges, perhaps a liquid or a solid, which would themselves be a hazard to the environment. There is little point, for instance, in spending a great deal of money to avoid atmospheric pollution if the local river becomes clogged with waste as a result.

In most industries there is more experience in adding anti-pollution apparatus to existing plant than in designing new plant to be acceptable from scratch. Ideally, of course, is much better, and in the long term usually cheaper to incorporate the anti-pollution measures in the "drawing" stage. The necessity to shut down a plant and practically rebuild it so that it conforms to accepted standards can be highly expensive. Obviously once there is an existing experience of designing a new plant in this way that experience can be tapped by others later on. International research work can also be called on.

An example of this is the Andesley primary aluminium reduction plant. Apart from the fact that this plant, like all others, had to conform to the requirements of the Alkali and Clean Air Inspectorate, the site of this one in an agricultural environment made anti-pollution a specially important aspect of design.

The principal potential pollutant in this plant was a fluoride emission from the electrolytic

The principal potential pollutant in this plant was a fluoride emission from the electrolytic

cells, and it was known that in some circumstances this could affect growing cattle. So a safe process had to be devised which would allow economic viability. The investigation and planning became an international undertaking—British specialist consultants were employed, information on fluorosis control in cattle was obtained from the Ministry of Agriculture, Fisheries and Food, and additional information was received from the University of Wisconsin and from Stuttgart. A pilot plant was even erected and tested in California and the results supplied by the designers at Anstey. Once the toxicological data were analysed, district monitoring schemes were started 15 months before plant commissioning and detailed sampling and analysis was made once the plant was in operation. So far all this effort has paid off and constant checks reveal that all is well.

This example illustrates the point that pollution control for large plant can involve a great deal of research and involves advanced technology. For instance, the iron and steel industry has been steadily reducing its dust emissions. As a result there have been significant advances in dust-arresting equipment, and electrostatic precipitators have been widely used to treat the aerial discharges from sinter strands, basic oxygen furnaces and other units in a steel works.

One industry where there has been a comprehensive improvement is ceramics. In the production of bricks, tiles and pipes, coal-firing used to be accepted practice. This meant that control of temperatures and lighting up procedures caused black smoke and dust discharge. To avoid this, heavy fuel oil was used by some but this caused the formation of acid soot because of the sulphur in the fuel. Extensive research efforts were made, and pollutants have now been reduced by switching to gas-firing, by changing to clays of low sulphur content and by improving the techniques. Also, by 1967, all coal-burning kilns were operating in Britain and only a few were using oil. Now the kilns are electric or gas and control is good without smoke emissions.

Similar stories can be told concerning cement works, oil refineries, the non-ferrous metal industry, power stations, and many more. The size of these plants undoubtedly brings special problems—but nothing that a few million pounds will not solve. That is the rub. If the big plants are going to be "neighbourly," as the phraseology goes, then they have to pay for it. If they are prepared to, these days they find a wealth of technology available to ensure that the money is well spent to both protect the community and keep the profits up.

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[illegible]

Index No.	Index No.	1955				Correlation
		High	Low	High	Low	
172.10	172.70	166.03	153.79	206.37	82.2	
		(17.1)	(6.8)	(45.73)	(25.6)	
144.82	186.02	129.15	187.90	205.73	73.6	
		(2.4)	(11.9)	(45.73)	(25.6)	
178.67	335.60	348.47	263.95	389.53	53.3	
		(17.1)	(6.8)	(35.72)	(27.6)	
153.02	280.38	307.80	228.45	350.04	64.8	
		(4.1)	(4.8)	(47.72)	(23.6)	
178.55	156.11	162.57	163.41	200.67	15.1	
		(2.6)	(2.5)	(26.73)	(25.6)	
155.17	146.20	156.64	129.16	180.58	41.3	
		(2.1)	(1.9)	(45.72)	(11.3)	
177.17	59.61	67.68	66.13	156.70	11.3	
		(2.1)	(1.9)	(45.72)	(11.3)	

05.09	153.40	173.76	141.59	177.41	168.87
	(11.1)	(10.8)	(10.9)	(11.2)	(10.8)
05.09	134.06	158.18	135.78	157.99	139.99
	(11.1)	(11.2)	(11.1)	(11.2)	(11.1)
05.09	325.72	251.95	187.21	357.41	71.11
	(11.1)	(11.1)	(11.1)	(11.2)	(11.1)
05.09	155.59	155.60	155.59	155.59	155.59
	(11.1)	(11.1)	(11.1)	(11.1)	(11.1)
05.09	152.76	152.76	152.76	152.76	152.76
	(11.1)	(11.1)	(11.1)	(11.1)	(11.1)
05.09	201.63	212.13	165.43	226.08	83.11
	(11.1)	(11.1)	(11.1)	(11.2)	(11.1)
05.09	245.91	265.25	187.61	381.87	80.11
	(11.1)	(11.1)	(11.1)	(11.2)	(11.1)
05.09	209.27	218.72	209.27	218.72	209.27
	(11.1)	(11.1)	(11.1)	(11.1)	(11.1)
05.09	278.39	325.35	204.05	529.59	156.11
	(11.1)	(11.1)	(11.1)	(11.2)	(11.1)
05.09	182.86	187.17	146.31	211.65	158.11
	(11.1)	(11.1)	(11.1)	(11.2)	(11.1)
05.09	201.21	221.34	191.34	231.34	191.34
	(11.1)	(11.1)	(11.1)	(11.1)	(11.1)
05.09	229.70	280.39	229.70	280.39	229.70
	(11.1)	(11.1)	(11.1)	(11.1)	(11.1)
05.09	118.54	125.47	95.52	135.69	87.11
	(11.1)	(11.1)	(11.1)	(11.2)	(11.1)
05.09	122.44	122.44	122.44	122.44	122.44
	(11.1)	(11.1)	(11.1)	(11.1)	(11.1)

8.71	205.64	215.80	161.55	253.72	89.9
7.55	273.61	289.56	236.48	339.16	94.3
5.73	56.34	80.73	61.76	135.72	44.5

0.57	183.29	191.47	165.24	201.92	93.1
		(17.1)	(4.9)	(31.188)	(25.6)
0.57	225.23	227.62	163.93	246.06	109.1
		(5.1)	(21.6)	(1.872)	(26.1)
1.54	471.60	515.97	430.07	517.00	90.1
		(19.1)	(6.9)	(5.1272)	(23.6)
0.678	228.30	242.39	188.32	255.83	75.1
		(17.1)	(4.3)	(3.1073)	(6.1)

72.21	196.63	407.00	104.67	220.17	140.00
(21)	(59)	(157)	(23)	(57)	(23)
58.45	287.08	528.59	264.26	431.86	277.00
(151)	(49)	(29)	(29)	(29)	(29)
30.60	205.40	217.40	178.51	227.95	64.00
(21)	(59)	(157)	(23)	(57)	(23)

01.10	205.58	250.42	175.05	241.41	69.1
		(91)	(63)	(214/72)	(30/8)
03.36	232.27	269.62	199.81	226.32	69.2
		(91)	(63)	(217/71)	(15/6)
04.31	299.81	258.57	167.52	293.15	67.5
		(23)	(78)	(26/72)	(18/6)
08.41	558.19	574.92	388.85	535.72	80.0

174.17	186.26	188.52	194.46	61.1
(21)	(79)	(46/73)	(38/61)	
132.05	141.37	102.16	155.76	54.4
(21)	(83)	(33/72)	(60/82)	
219.84	249.06	190.98	262.37	82.2
(21)	(69)	(21/72)	(183/72)	
208.23	255.13	184.86	278.57	50.4
(21)	(22/81)	(12/127)	(34/70)	

3.61	275.84	510.44	222.65	134.22	56.6
		(8/1)	(6/3)	(18/73)	(18/77)
7.69	233.89	281.14	174.94	503.15	120.1
		(2/1)	(2/3)	(26/472)	(20/472)
		(17/1)	(5/3)	(18/672)	(31/12)
5.68	210.09	226.15	171.91	245.76	80.1
		(15/1)	(12/3)	(25/472)	(22/672)

9.21	204.27	219.02	172.59	228.15	83.
	(10/1)	(6/3)	(15/72)	(25/5)	

2.14	520.94	565.57	415.62	655.57	84.1
	(23/7)	(22/1)	(26/17/73)	(25/8/7)	
4.20	99.55	120.92	105.61	121.47	59.5
	(16/1)	(31/9)	(15/72)	(14/11/1)	
2.23	402.32	567.78	350.66	567.78	84.1
	(11/1)	(3/9)	(16/77/78)	(29/4/7)	
4.48	118.93	127.69	96.59	175.90	70.7
	(36/1)	(12/9)	(34/6/69)	(21/1)	

Cura apt. to	Year ago (approx.)	Since Compilation			
		High	Low	High	Low
0.50	26.52	125.54	85.67	125.54	54.4
		12.1	12.9	12.173	21.5

1.75	9.59	—	—	—
1.00	74.89	74.22	61.00	115.42
0.77	71.32	72.05	60.54	113.48
2.93	75.69	69.76	52.21	114.41

7.17	77.53	77.55	66.90	114.41	66.6
		8.1	17.8	7.10.63	17.8

List of the constituents of the F.T.-Actuarial Indices is now available from the Publishers of Financial Times, Bracken House, Cannon Street, EC4A 3BY, price 12p. By inland post 3p.

wealth 18p. Foreign 22p.
INSTITUTION CHANGE: Shipton Automation
 placed by Office Electronics Machines Limited
 (Equipment). Army and Navy Stores has been
 sold by Maple Macowards Limited (Stores).

2/ Yield

Save and Prosper Group				
Control	Gt St Helen's, London, E.C.1	500	1	
7/25/71	£1,000,000	96.4	101.5	+1.1
	Equity Bonds	86.0	90.8	+4.8
	Equity Pension Fd	86.0	101.1	+14.1
	Mini Bonds	24.8	25.7	+0.9
	Property Fd	117.1	123.5	+6.4
3/26/71	Prop Fd	101.8	107.2	+5.4

*Price on Sept. 29. --Sept. 17. --Sept. 10. --Sept. 3. --

Saveguard Assurance Limited
Swan Court, Peterfield, Bangor. Phone 2-1111
Investment Fm 101.5 107.0

Schroder Assurance Ltd.
212-325 E. Holborn WC1V 7PB
*Electric Fm 101.5 107.0

Sent. Widows' Fund. & Life Ass. Soc.
9. St. Andrew's Sq., Edinburgh SBZ 7
Invest. P.Y. Sept 233.5 238.5
Sun Life of Canada (U.K.) Ltd.
2, & 4 Cockburn St. SW1Y SBZ 000.5
Maple Leaf Sept 139.5

Target Life Insurance Co. Ltd.	
Target: House, Gatehouse Rd., Arisbury	
Bucks. Arisbury 0296 5	
Mangl Bond Add.	86.5 101.9
Prop Bond Accum	137.0
Prop Bond Invest	126.0
Net Plan Cap	64.2 68.1
Re: Plan Acc Pen	86.5 70.6

The Trident Insurance Co. Ltd.			
No. 1, Kingsway, W.C.2	01-836	27	
Trident Man. Fd.	95.0	100.0	
Trident Gen. Inv. Fd.	95.0	100.0	
Trident Prop. Inv. Fd.	95.0	100.0	
Trident Equity Fd.	95.0	100.0	
Trident Bg. Inv. Fd.	95.0	100.0	

Trident Investors Life Assurance

Marlowe Bldg., Lloyd's Ave.,	ECBN 1	
01481 8		
*Incident Fd Sept 22 154.0 173.0		
Tyndall Assurance Ltd.		
18, Canynge Road, Bristol.		
*Bom: Fd Sept 15 116.4		
*Equip Fd Sept 19 152.0		
*Pro: Fd Sept 19 140.0		

Ad.	5-war Int. Sept. 13	1322.93	
870	*Gross in Sept. 13	33.8	97.0
	Next sub day Oct. 17.		* Oct. 3

Tyndall Pensions Ltd.		
10, Leinster Road, Dublin 2.		0272 33
Part Pensions	77.0	
Part Pensions	104.8	
Part Pensions	113.6	
Part Pensions	101.2	
Part Pensions	100.8	
Next val. Oct. 1		

	Vassarsser Life Assurance Ltd.	
	Marlowe Hse., Lords Ave., EC3	07-621 8
	Total Income Tax	94.5 99.5
	Welfare Insurance Company Ltd.	
	The Leas, Folkestone, Kent	0493 52
	Export Plan, F.	98.2
	Export Prop. F.	117.9
	East Ang. Ins. Co.	95.7

Electric Fund..	913	
Marine Tel. Co.	1050	
Wm. W. W. Co.	1010	
Wm. W. W. Co.	1254	
Windsor Life Assurance Co. Ltd.		
1, High Street, Windsor.		Tel. 68

NOTES

Yield allows for all testing expenses
Fence except where otherwise in-
cluded. Single premium insurance bond
Net of tax on realized capital gain
Index.

Not available: ~~withholding~~

3

HOTELS—Continued

PK	High	Low	Stock	Price	+ or -	No. Shs.	Cr.
7	47	47	Stamps (Rev. 10p)	36		77	127
12	48	47	Stamps (Rev. 10p)	36		77	127
13	48	47	Stamps (Rev. 10p)	36		77	127
14	48	47	Stamps (Rev. 10p)	36		77	127
15	48	47	Stamps (Rev. 10p)	36		77	127
16	48	47	Stamps (Rev. 10p)	36		77	127
17	48	47	Stamps (Rev. 10p)	36		77	127
18	48	47	Stamps (Rev. 10p)	36		77	127
19	48	47	Stamps (Rev. 10p)	36		77	127
20	48	47	Stamps (Rev. 10p)	36		77	127
21	48	47	Stamps (Rev. 10p)	36		77	127
22	48	47	Stamps (Rev. 10p)	36		77	127
23	48	47	Stamps (Rev. 10p)	36		77	127
24	48	47	Stamps (Rev. 10p)	36		77	127
25	48	47	Stamps (Rev. 10p)	36		77	127
26	48	47	Stamps (Rev. 10p)	36		77	127
27	48	47	Stamps (Rev. 10p)	36		77	127
28	48	47	Stamps (Rev. 10p)	36		77	127
29	48	47	Stamps (Rev. 10p)	36		77	127
30	48	47	Stamps (Rev. 10p)	36		77	127
31	48	47	Stamps (Rev. 10p)	36		77	127
32	48	47	Stamps (Rev. 10p)	36		77	127
33	48	47	Stamps (Rev. 10p)	36		77	127
34	48	47	Stamps (Rev. 10p)	36		77	127
35	48	47	Stamps (Rev. 10p)	36		77	127
36	48	47	Stamps (Rev. 10p)	36		77	127
37	48	47	Stamps (Rev. 10p)	36		77	127
38	48	47	Stamps (Rev. 10p)	36		77	127
39	48	47	Stamps (Rev. 10p)	36		77	127
40	48	47	Stamps (Rev. 10p)	36		77	127
41	48	47	Stamps (Rev. 10p)	36		77	127
42	48	47	Stamps (Rev. 10p)	36		77	127
43	48	47	Stamps (Rev. 10p)	36		77	127
44	48	47	Stamps (Rev. 10p)	36		77	127
45	48	47	Stamps (Rev. 10p)	36		77	127
46	48	47	Stamps (Rev. 10p)	36		77	127
47	48	47	Stamps (Rev. 10p)	36		77	127
48	48	47	Stamps (Rev. 10p)	36		77	127
49	48	47	Stamps (Rev. 10p)	36		77	127
50	48	47	Stamps (Rev. 10p)	36		77	127
51	48	47	Stamps (Rev. 10p)	36		77	127
52	48	47	Stamps (Rev. 10p)	36		77	127
53	48	47	Stamps (Rev. 10p)	36		77	127
54	48	47	Stamps (Rev. 10p)	36		77	127
55	48	47	Stamps (Rev. 10p)	36		77	127
56	48	47	Stamps (Rev. 10p)	36		77	127
57	48	47	Stamps (Rev. 10p)	36		77	127
58	48	47	Stamps (Rev. 10p)	36		77	127
59	48	47	Stamps (Rev. 10p)	36		77	127
60	48	47	Stamps (Rev. 10p)	36		77	127
61	48	47	Stamps (Rev. 10p)	36		77	127
62	48	47	Stamps (Rev. 10p)	36		77	127
63	48	47	Stamps (Rev. 10p)	36		77	127
64	48	47	Stamps (Rev. 10p)	36		77	127
65	48	47	Stamps (Rev. 10p)	36		77	127
66	48	47	Stamps (Rev. 10p)	36		77	127
67	48	47	Stamps (Rev. 10p)	36		77	127
68	48	47	Stamps (Rev. 10p)	36		77	127
69	48	47	Stamps (Rev. 10p)	36		77	127
70	48	47	Stamps (Rev. 10p)	36		77	127

INDUSTRIALS—(Miscell.)							
7	47	47	Stamps (Rev. 10p)	36		77	127
12	48	47	Stamps (Rev. 10p)	36		77	127
13	48	47	Stamps (Rev. 10p)	36		77	127
14	48	47	Stamps (Rev. 10p)	36		77	127
15	48	47	Stamps (Rev. 10p)	36		77	127
16	48	47	Stamps (Rev. 10p)	36		77	127
17	48	47	Stamps (Rev. 10p)	36		77	127
18	48	47	Stamps (Rev. 10p)	36		77	127
19	48	47	Stamps (Rev. 10p)	36		77	127
20	48	47	Stamps (Rev. 10p)	36		77	127
21	48	47	Stamps (Rev. 10p)	36		77	127
22	48	47	Stamps (Rev. 10p)	36		77	127
23	48	47	Stamps (Rev. 10p)	36		77	127
24	48	47	Stamps (Rev. 10p)	36		77	127
25	48	47	Stamps (Rev. 10p)	36		77	127
26	48	47	Stamps (Rev. 10p)	36		77	127
27	48	47	Stamps (Rev. 10p)	36		77	127
28	48	47	Stamps (Rev. 10p)	36		77	127
29	48	47	Stamps (Rev. 10p)	36		77	127
30	48	47	Stamps (Rev. 10p)	36		77	127
31	48	47	Stamps (Rev. 10p)	36		77	127
32	48	47	Stamps (Rev. 10p)	36		77	127
33	48	47	Stamps (Rev. 10p)	36		77	127
34	48	47	Stamps (Rev. 10p)	36		77	127
35	48	47	Stamps (Rev. 10p)	36		77	127
36	48	47	Stamps (Rev. 10p)	36		77	127
37	48	47	Stamps (Rev. 10p)	36		77	127
38	48	47	Stamps (Rev. 10p)	36		77	127
39	48	47	Stamps (Rev. 10p)	36		77	127
40	48	47	Stamps (Rev. 10p)	36		77	127
41	48	47	Stamps (Rev. 10p)	36		77	127
42	48	47	Stamps (Rev. 10p)	36		77	127
43	48	47	Stamps (Rev. 10p)	36		77	127
44	48	47	Stamps (Rev. 10p)	36		77	127
45	48	47	Stamps (Rev. 10p)	36		77	127
46	48	47	Stamps (Rev. 10p)	36		77	127
47	48	47	Stamps (Rev. 10p)	36		77	127
48	48	47	Stamps (Rev. 10p)	36		77	127
49	48	47	Stamps (Rev. 10p)	36		77	127
50	48	47	Stamps (Rev. 10p)	36		77	127
51	48	47	Stamps (Rev. 10p)	36		77	127
52	48	47	Stamps (Rev. 10p)	36		77	127
53	48	47	Stamps (Rev. 10p)	36		77	127
54	48	47	Stamps (Rev. 10p)	36		77	127
55	48	47	Stamps (Rev. 10p)	36		77	127
56	48	47	Stamps (Rev. 10p)	36		77	127
57	48	47	Stamps (Rev. 10p)	36		77	127
58	48	47	Stamps (Rev. 10p)	36		77	127
59	48	47	Stamps (Rev. 10p)	36		77	127
60	48	47	Stamps (Rev. 10p)	36		77	127
61	48	47	Stamps (Rev. 10p)	36		77	127
62	48	47	Stamps (Rev. 10p)	36		77	127
63	48	47	Stamps (Rev. 10p)	36		77	127
64	48	47	Stamps (Rev. 10p)	36		77	127
65	48	47	Stamps (Rev. 10p)	36		77	127
66	48	47	Stamps (Rev. 10p)	36		77	127
67	48	47	Stamps (Rev. 10p)	36		77	127
68	48	47	Stamps (Rev. 10p)	36		77	127
69	48	47	Stamps (Rev. 10p)	36		77	127
70	48	47	Stamps (Rev. 10p)	36		77	127

[illegible]

81	65	75	85	95	105	115	125	135	145	155	165	175	185	195	205	215	225	235	245	255	265	275	285	295	305	315	325	335	345	355	365	375	385	395	405	415	425	435	445	455	465	475	485	495	505	515	525	535	545	555	565	575	585	595	605	615	625	635	645	655	665	675	685	695	705	715	725	735	745	755	765	775	785	795	805	815	825	835	845	855	865	875	885	895	905	915	925	935	945	955	965	975	985	995					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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